



**EYE BANK
ASSOCIATION
of AMERICA**

A4743-1F

5/88

1987 EYE BANKING ACTIVITY - SETS RECORD

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Prepared: May 10, 1988

In 1987 a record number of 80,476 eyes and corneas was donated by humanitarian citizens, 19.0 percent higher than the previous record total of 67,599 in 1986. A record number of 35,930 corneas was supplied for transplant, 4,590 (14.6 percent) more than the previous record in 1986. This report details the sources and uses for these donations, and it offers an analysis of trends within eye banking.

Facts About Eye Donation and Corneal Transplantation

The cornea, the clear surface at the front of the eye, is the main focusing element of the eye. If the cornea becomes cloudy from inherited disease, injury, infections, chemical burns, congenital disease, or many other causes, vision can be dramatically reduced. Not all donated eyes have corneas suitable for transplant. Sometimes a cornea may not be suitable for transplant because of the donor's medical history, or the cornea may have lost much of its opacity.

All eyes not used for transplant are used for valuable research or teaching programs. Human eyes are vital, and in many cases have no substitute, for the study of many ophthalmic problems, such as diabetes, glaucoma and retinal disease. An eye donation sometimes can be used for more than one purpose with the cornea being used for transplant and the rest of the eye for valuable research or training.

Overview of Statistics

In 1987, the 107 eye banks in the United States and Canada collected a total of 80,476 eyes and corneas (55,633 were whole eye donations while 24,843 were cornea-only donations). A record number of 35,930 corneas was supplied for transplant, 4,590 (14.6 percent) more than the previous record in 1986.

In 1987, 35,427 eyes were used for research and teaching programs. Another 8,367 corneas were provided for epikeratophakia, a surgical procedure that corrects refractive errors for patients with high degrees of vision loss. Of the total number of eyes and corneas donated, 44.7 percent were used for corneal transplants, 44.0 percent for research and teaching, 10.4 percent for epikeratophakia and 0.9 percent after evaluation were discarded for patient safety purposes.

The amount of eyes obtained in 1987 was a 19.0 percent increase over the previous record established in 1986. Much of this progress is due to increased public support for organ and tissue donation, especially in the growing number of states with laws requiring that the option of organ and tissue donation be considered in cases of hospital deaths (43 at this writing).

Table 1: Total Donations

	<u>1987</u>	<u>1986</u>
Whole Eyes	55,633	44,686
Corneal Only	24,843	22,913
All Donations	80,476	67,599
Corneal Grafts	35,930	31,340
Epikeratophakia	8,367	7,387
Donations for Re- search, Training	35,427	29,089
	(107 eye banks)	(103 eye banks)

Variations in Activity Among Eye Banks

Eye banks vary greatly in the size of their territory, population, programs, staff, board of directors and medical advisors. The data in Table 2 support these differences.

Table 2: Total Eye and Corneal Donations Obtained by Eye Banks

	<u>Number of Eye and Corneal Donations</u>					
	0- 99	100- 299	300- 599	600- 999	1000- 1999	2000+
<u># of Eye Banks</u> 1987 (n=107)	17	24	24	17	14	11
<u>% of Tot. Donations</u>	1.1%	5.6%	13.3%	17.7%	23.2%	39.1%
<u># of Eye Banks</u> 1986 (n=103)	19	23	28	13	13	7
<u>% of Tot. Donations</u>	1.3%	6.0%	17.9%	14.2%	29.7%	30.9%

The above figures indicate several trends:

- (1) The number of small eye banks slowly is declining. In 1987, 61 percent of the eye banks obtained fewer than 600 donations, versus 66 percent in 1986.
- (2) A significant proportion of the eye banks (16 percent in 1987 versus 18 percent in 1986), still is obtaining less than two percent of the total eyes and corneas donated.
- (3) 1987 brought a large increase in the percentage of eye banks obtaining 1,000 or more total eye and corneas (23 percent versus 19 percent in 1986).
- (4) In summary, although a significant number of eye banks is obtaining a small volume of eyes, the trend is moving toward more eye banks becoming larger.

Comparison By Number of Grafts Performed

The demand for corneas for transplant varies greatly among the areas served by the various eye banks. Listed below are data for eye banks showing corneas used locally for transplant. The distribution of these changed significantly from 1986 to 1987 as more eye banks now are in the two largest categories.

Table 3: Eye Banks by Number of Grafts Performed Locally

	<u>Number of Grafts</u>				
	0- 49	50- 199	200- 499	500- 999	1000+
<u># of Eye Banks</u> 1987 (n=107)	16	38	35	14	4
<u>% of Eye Banks</u>	15.9%	35.5%	32.7%	13.1%	3.8%
<u># of Eye Banks</u> 1986 (n=103)	16	42	32	9	4
<u>% of Eye Banks</u>	15.5%	40.8%	31.1%	8.7%	3.9%

Eye Banks Sharing Corneas for Transplant

The first priority for the use of corneas, except in cases of emergency surgery, is in the local area where they are donated. Corneas are shared with other eye banks or corneal surgeons when a temporary surplus or a need exists. Corneas generally have to be transplanted within a week to 10 days after donation, depending on the method of storage. Unlike organs, corneas in over 90 percent of the cases do not require tissue typing, so matching a cornea with a recipient is not as necessary.

A total of 24,970 of the eyes and corneas donated locally was used locally in corneal transplants in 1987, (a 18.6 percent increase over the 21,050 local transplants from local donations in 1986). A total of 11,320 corneas was shared in 1987 (31.2 percent of surgical tissue), versus 10,290 corneas shared in 1986 (32.7 percent of surgical tissue), a 10 percent increase.

As in 1986, the majority of the shared corneas is shipped by a small number of eye banks. In 1986, the six eye banks which shared over 300 corneas accounted for 61.2 percent of the total, versus nine eye banks sharing over 300 corneas in 1987 which accounted for 55.7 percent of the total shared. The increase in those in the 50-99 and 100-299 categories accounts for most of the percentage drop by those in the 300 and over category (see Table 4).

Of the 11,333 corneas shared for transplant, 8,860 (78.2 percent) were shared in the United States and Canada, and 2,473 (21.8 percent) were shared outside of that area. The trend is toward more eye banks sharing a larger amount of corneas, although nearly half annually share fewer than 20.

Table 4: Eye Banks by Number of Corneas Shared for Transplant

	<u>Corneas</u>				
	0- 19	20- 49	50- 99	100- 299	300+
<u># of Eye Banks</u> <u>1987 (n=107)</u>	52	15	14	17	9
<u>% of Eye Banks</u>	48.6%	14.0%	13.1%	15.9%	8.4
<u># of Eye Banks</u> <u>1986 (n=103)</u>	47	22	6	16	12
<u>% of Eye Banks</u>	45.6%	21.4%	5.8%	15.5%	11.7%

Eye Banks Receiving Shared Corneas

Eye banks receive shared corneas for surgery from another eye bank during those times when the local supply of corneas does not meet the local need. The distribution of those receiving shared corneas in 1987 is different than that in 1986. More eye banks are receiving a lower number of shared corneas, a result probably due to the 19 percent increase in corneas procured for transplant by eye banks in 1987.

Table 5: Eye Banks by Number of Shared Corneas Received For Surgery

	<u>Number of Grafts</u>				
	0- 19	20- 49	50- 99	100- 199	200+
<u># of Eye Banks</u> <u>1987 (n=104)</u>	56	16	14	9	2
<u>% of Eye Banks</u>	61.7%	15.0%	13.0%	8.4%	1.9%
<u># of Eye Banks</u> <u>1986 (n=103)</u>	55	20	14	10	4
<u>% of Eye Banks</u>	53.4%	19.4%	13.6%	9.7%	3.9%

Sources of Donations

Data in this section are for all North American eye banks. Source data in 1986 are reported on 82 percent of the 44,686 whole eyes obtained and 99 percent of the 22,913 corneas obtained. Source data in 1987 are reported on 100 percent of the whole eyes and corneas obtained.

Table 6: Sources of Donations

	<u>Whole Eyes</u>		<u>Corneas</u>	
	1986 (36,487)	1987 (55,633)	1986 (22,514)	1987 (24,843)
Hospital	29,278 (80%)	48,484 (87%)	4,080 (18%)	7,712 (31%)
Funeral	5,509 (15%)	4,916 (9%)	348 (2%)	285 (1%)
Director				
Medical	763 (2%)	829 (1%)	18,086 (80%)	16,567 (67%)
Other Sources	937 (3%)	1,404 (3%)	0	279 (1%)

These data show some important trends in sources of donations.

1. The major increase in overall donations is in hospital donations. The growth in the impact of required request legislation undoubtedly has been the major factor in increasing whole eye donations in hospitals 66 percent and corneal donations 89 percent.

2. The decrease in donations from funeral director programs (-11 percent for whole eyes and -18 for corneas) and the 8 percent decrease in corneas donated through the medical examiner programs are in large part related to more effective programs in hospitals which present the option of donation.

Limitations of This Report

Three eye banks did not report data, so their 1986 data were used. If available, this data would increase the total figures by less than two percent. All data are self-reported by each eye bank, so data are not included from other procurement agencies which obtain eyes or from physicians who obtain or receive eyes without using their local eye bank.

Conclusions

Despite the 13 percent increase in corneal transplants in the past year, between 3,500 and 5,000 Americans still were waiting for transplants as of January 1, 1988 because of a shortage of donated corneas.

Although the number of people on the list is about the same as January 1, 1987, the average time on the waiting list nationally is now between one and two months, less than half of the waiting time from the previous year.

The reasons for being on a waiting list for corneal transplant surgery are quite different from those for being on an organ transplant waiting list. Those waiting for organs do so because

of a more severe shortage of organs than corneas and because of the greater need for specific matching of medical characteristics between recipients and organ donors. People appear on a corneal transplant waiting list for several reasons. The major reason is that in many areas the demand for corneas for transplant exceeds the amount available. A small number of patients are waiting for antigen matched corneas to hopefully minimize the chances of rejection.

The purposes of eye banks are to have corneas readily available for anyone who needs a transplant, as well as to continue to supply tissue for valuable research and teaching programs. The improvements in eye banking in the 1980s, coordinated by the Eye Bank Association of America, the American Academy of Ophthalmology, other professional groups in transplantation and eye banks, have greatly increased the number of people who can see due to corneal transplants and refractive surgery. Eye banking also has been assisted by the growing public support for organ and tissue donation, as evidenced by the large number of states with laws requiring that the option of organ and tissue donation be considered in cases of hospital deaths (43 at this writing). As more of these laws go in effect, expectations are that the number of eye donations will grow substantially.

The EBAA will continue to develop programming to maintain quality control in eye banking; to enhance public and professional education; to improve networking among eye banks; and to strengthen smaller eye banks. This dedication will assist eye banks in obtaining the large amount of tissue needed to eliminate the waiting list for sight-restoring surgery and to assist researchers in the discovery of treatments and solutions for many sight-hindering conditions.

CITIES LISTED
IN ALPHA ORDER BY STATE

TOTAL EYE AND CORNEA DONATIONS - 1987

	TOTAL DONATIONS	LOCAL GRAFTS	LOCAL RES/TRG	SHARED GRAFTS	EPI TISSUE	SHARED RES/TRG	TOTAL CORNEAS FOR GRAFT
BIRMINGHAM	1068	175	176	342	272	60	517
SHEFFIELD	68	7	14	4	2	38	11
PHOENIX	2152	375	524	628	246	271	1003
LITTLE ROCK-EYE&KIDNEY*	111	38	69	4	0	0	42
LITTLE ROCK-ARK. EYE BK	390	176	200	10	4	0	186
FRESNO	322	89	27	169	1	5	258
UCI IRVINE	254	18	152	52	87	10	70
LOMA LINDA	1240	236	200	317	237	156	553
LOS ANGELES-DOHENY	2968	1135	684	436	683	2	1571
LOS ANGELES-UCLA *	22	0	8	11	0	0	11
ORANGE COUNTY	752	188	213	170	154	27	358
SACRAMENTO	448	256	114	50	0	28	306
SAN DIEGO	2115	440	987	723	0	0	1163
SAN FRANCISCO	958	470	400	87	0	0	557
DENVER-COLORADO	140	91	46	3	0	0	94
DENVER-ROCKY MT	986	376	225	108	250	27	484
NEW BRITAIN	758	213	535	2	0	3	215
WILMINGTON	626	148	224	85	165	4	233
DIST. OF COL. - LIONS	424	79	277	59	9	0	138
DIST. OF COL. - TBI	440	23	286	54	77	0	77
GAINESVILLE	588	163	421	2	2	0	165
MIAMI	2576	1629	947	0	0	0	1629
ORLANDO	2344	504	65	254	882	652	758
TAMPA	1306	230	501	274	0	255	504
ATLANTA	1625	615	540	124	346	0	739
AUGUSTA	239	75	81	45	0	8	120
HONOLULU	48	38	3	1	0	2	39
BOISE	175	43	73	43	10	6	86
BLOOMINGTON	152	33	10	46	2	39	79
CENTRALIA	58	12	20	4	0	22	16
INDIANAPOLIS-LIONS	553	294	205	23	4	2	317
INDIANAPOLIS-METH. HOSP	99	74	25	0	0	0	74
IOWA CITY	657	266	378	13	0	0	279
KANSAS CITY-KS	499	89	292	62	0	0	151
WICHITA	200	75	108	3	6	8	78
LEXINGTON	726	233	276	201	0	16	434
LOUISVILLE	423	199	168	57	0	0	256
BATON ROUGE	73	20	41	2	0	0	22
NEW ORLEANS	427	229	176	11	7	4	240
SHREVEPORT	442	90	98	82	138	34	172
BALTIMORE	3787	256	1489	1116	786	126	1372
BOSTON	875	406	465	0	0	0	406
ANN ARBOR**	3729	1986	1214	231	296	2	2217
MARQUETTE	58	5	41	12	0	0	17
MINNEAPOLIS	996	250	746	0	3	0	250
ROCHESTER-MN	219	107	76	37	0	0	144
JACKSON	230	164	8	13	0	46	177
COLUMBIA-MO	815	150	821	51	0	0	201
KANSAS CITY-MO	1084	213	759	42	0	70	255
ST. LOUIS-ARC	632	137	350	11	10	0	148
ST. LOUIS EYE BANK	579	288	275	0	56	0	288
MISSOULA	376	58	28	164	31	95	222
OMAHA	302	115	132	21	0	22	136
LAS VEGAS	86	60	22	4	0	0	64

*1986 DATA

**INCLUDES CHICAGO DATA

CITIES LISTED

IN ALPHA ORDER BY STATE

	TOTAL DONATIONS	LOCAL GRAFTS	LOCAL RES/TRG	SHARED GRAFTS	EPI TISSUE	SHARED RES/TRG	TOTAL CORNEAS FOR GRAFT
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IN ALPHA ORDER BY STATE

	TOTAL DONATIONS	LOCAL GRAFTS	LOCAL RES/TRG	SHARED GRAFTS	EPI TISSUE	SHARED RES/TRG	TOTAL CORNEAS FOR GRAFT
NEWARK	300	132	168	1	0	0	133
ALBUQUERQUE	165	29	69	6	3	26	35
ALBANY	188	92	93	3	0	0	95
BUFFALO	495	122	140	32	150	51	154
MANHASSET	114	52	29	0	0	0	52
NEW YORK CITY	1661	825	715	21	0	0	846
ROCHESTER-NY	1919	146	485	342	137	809	488
SYRACUSE	696	205	424	67	0	0	272
WINSTON-SALEM	1163	569	395	76	28	95	645
CANTON	95	37	6		0	37	
CINCINNATI	1082	201	549	105	163	2	306
CLEVELAND	1505	529	658	155	202	116	684
COLUMBUS	547	327	241	26	4	2	353
DAYTON	714	197	254	194	47	24	391
TOLEDO	124	34	31	51	0	1	85
OKLAHOMA CITY	246	110	122	0	13	0	110
PORTLAND	2398	274	1667	281	373	172	555
ERIE	164	26	12	13	0	84	39
PHILADELPHIA	1294	338	618	0	308	0	338
PITTSBURGH	964	454	454	5	20	0	459
HATO REY*	196	107	0	0	0	0	107
WEST COLUMBIA	254	72	138	0	0	44	72
SIOUX FALLS	40	5	2	27	0	6	32
CHATTANOOGA	178	86	46	44	0	2	130
KNOXVILLE	218	110	48	36	0	24	146
MEMPHIS	603	314	289	0	0	0	314
NASHVILLE	182	107	33	39	3	0	146
ABILENE	18	2	2	4	0	10	6
AMARILLO	54	26	10	0	8	0	26
AUSTIN	444	178	86	160	20	0	338
CORPUS CHRISTI	286	95	22	77	74	12	172
DALLAS	854	598	133	83	10	0	681
EL PASO	171	112	7	42	10	0	154
FORT WORTH	321	111	88	54	32	0	165
HOUSTON	3889	740	1027	1595	414	5	2335
LACKLAND AFB	20	2	12	6	0	0	8
LUBBOCK	23	3	11	7	2	0	10
SAN ANTONIO	722	281	95	228	0	29	509
TEMPLE	68	24	40	2	2	0	26
TYLER	33	4	6	19	0	0	23
SALT LAKE CITY	940	614	154	46	74	8	660
NORFOLK	510	67	186	153	4	58	220
RICHMOND	482	225	125	24	2	106	249
ROANOKE	190	108	82	0	0	0	108
SEATTLE	2908	654	1239	58	782	0	712
SOUTH CHARLESTON	511	135	53	124	190	9	259
MADISON	2589	236	1026	478	453	396	714
MILWAUKEE	1913	205	1670	16	0	22	221
ALBERTA*	438	242	197	9	3	0	251
SASKATOON	71	25	42	4	0	0	29
TORONTO	1501	786	684	0	0	0	786
VANCOUVER	556	284	184	9	70	2	293
WINNEPEG	239	74	149	12	0	4	86

*1986 DATA

SUMMARY FIGURES	80476	24970	31231	10997	8367	4196	35930
(ALPHA BY STATE)	TOTAL	LOCAL	LOCAL	SHARED	EPI	SHARED	TOTAL
CITY	DONATIONS	GRAFTS	RES/TRG	GRAFTS	TISSUE	RES/TRG	CORNEAS FOR GRAFT